

**THAT WHICH IS CLAIMED IS:**

1. A method for making a MOSFET comprising:  
forming a trench in a semiconductor layer;  
forming a gate dielectric layer lining the  
trench;  
5 forming a gate conducting layer in a lower  
portion of the trench;  
forming a dielectric layer to fill an upper  
portion of the trench;  
removing portions of the semiconductor layer  
10 laterally adjacent the dielectric layer so that an  
upper portion thereof extends outwardly from the  
semiconductor layer;  
forming spacers laterally adjacent the  
outwardly extending upper portion of the dielectric  
15 layer; and  
using the spacers as a self-aligned mask for  
defining source/body contact regions.
2. A method according to Claim 1, wherein  
using the spacers as a self-aligned mask comprises  
implanting dopants for defining the source/body contact  
regions.
3. A method according to Claim 1, wherein  
using the spacers as a self-aligned mask comprises  
etching the semiconductor layer not covered by the  
spacers.
4. A method according to Claim 3, wherein  
the etching is performed to a depth equal to or less  
than about 1 micron from a surface of the semiconductor  
layer.

5. A method according to Claim 1, further comprising forming source regions in the semiconductor layer adjacent the outwardly extending dielectric layer before forming the spacers.

6. A method according to Claim 5, further comprising forming a source electrode on the source regions and on the dielectric layer.

7. A method according to Claim 6, further comprising forming at least one conductive via between the source electrode and the source/body contact regions.

8. A method according to Claim 5, further comprising forming a source electrode on the source regions, on the dielectric layer and on the source/body contact regions.

9. A method according to Claim 1, further comprising removing the spacers.

10. A method according to Claim 1, wherein removing portions of the semiconductor layer is performed to a depth equal to or less than about 1 micron from a surface thereof.

11. A method according to Claim 1, wherein the gate conducting layer is recessed in the trench within a range of about 0.2 to 0.8 microns from an opening thereof.

12. A method according to Claim 1, further comprising forming a body in the semiconductor layer adjacent the trench.

13. A method for making a MOSFET comprising:  
forming a trench in a semiconductor layer;  
forming a gate dielectric layer lining the  
trench;
- 5           forming a gate conducting layer in a lower  
portion of the trench;  
          forming a dielectric layer to fill an upper  
portion of the trench;  
          removing portions of the semiconductor layer  
10 laterally adjacent the dielectric layer so that an  
upper portion thereof extends outwardly from the  
semiconductor layer;  
          forming spacers laterally adjacent the  
outwardly extending upper portion of the dielectric  
15 layer;  
          using the spacers as a self-aligned mask for  
etching the semiconductor layer not covered by the  
spacers; and  
          using the spacers as a self-aligned mask for  
20 implanting dopants for defining source/body contact  
regions.

14. A method according to Claim 13, wherein  
the etching is performed to a depth equal to or less  
than about 1 micron from a surface of the semiconductor  
layer.

15. A method according to Claim 13, further  
comprising forming source regions in the semiconductor  
layer adjacent the outwardly extending dielectric layer  
before forming the spacers.

16. A method according to Claim 15, further  
comprising forming a source electrode on the source  
regions and on the dielectric layer.

17. A method according to Claim 16, further comprising forming at least one conductive via between the source electrode and the source/body contact regions.

18. A method according to Claim 15, further comprising forming a source electrode on the source regions, on the dielectric layer and on the source/body contact regions.

19. A method according to Claim 13, further comprising removing the spacers.

20. A method according to Claim 13, wherein removing portions of the semiconductor layer is performed to a depth equal to or less than about 1 micron from a surface thereof.

21. A method according to Claim 13, wherein the gate conducting layer is recessed in the trench within a range of about 0.2 to 0.8 microns from an opening thereof.

22. A method according to Claim 13, further comprising forming a body region in the semiconductor layer adjacent the trench.

23. A MOSFET comprising:  
a semiconductor layer having a trench  
therein;  
a gate dielectric layer lining the trench;  
5 a gate conducting layer in a lower portion of  
the trench;

a dielectric layer in an upper portion of the trench and extending outwardly from said semiconductor layer;

10           source regions adjacent the outwardly extending dielectric layer; and  
          source/body contact regions laterally spaced from said gate conducting layer.

24. A MOSFET according to Claim 23, further comprising a source electrode on said source regions and on said dielectric layer.

25. A MOSFET according to Claim 24, further comprising at least one conductive via between said source electrode and said source/body contact regions.

26. A MOSFET according to Claim 23, wherein a portion of said source regions include a recess over said source/body contact regions.

27. A MOSFET according to Claim 23, wherein a portion of said source regions include an opening exposing said source/body contact regions; and further comprising a source electrode on said source regions,  
5   on said dielectric layer, and on said source/body contact regions.

28. A MOSFET according to Claim 23, wherein said outwardly extending dielectric layer extends from said source regions equal to or less than about 1 micron.

29. A MOSFET according to Claim 23, wherein the gate is recessed in the trench within a range of about 0.2 to 0.8 microns from an opening thereof.

